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Group Art Unit: 1714

Attorney  
Docket: 2405/3

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i) fuel cell use contributes to the conservation and maintenance air, water and soil since fuel cell emissions are substantially water and do not contain pollutants;



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ii) fuel cell use contributes to the more efficient utilization and conservation of energy as it is inherently an efficient method of energy production.

The use of the electrode and the fuel cell of the above-referenced patent application will promote the replacement of internal combustion engines with fuel cells by improving the current characteristics and reducing the size of fuel cells.

3. The advantages of fuel cells as portable sources of electricity over other sources such as batteries are manifold and well documented. Some of the advantages have been recently discussed in the July 2001 of "Scientific American". Fuel cells are limitlessly rechargeable and, even if discarded, are substantially non-polluting, in contrast to batteries that are considered environmentally hazardous waste.

Fuel cell use can contribute to the conservation and maintenance water and soil and the efficient utilization of energy in mobile applications by replacing batteries. The use of the fuel composition of the above-referenced patent application will promote the replacement of batteries with fuel cells by improving the current characteristics and reducing the size of fuel cells.

4. Certain fuel cells known in the art are based on processing natural gas to produce hydrogen used as fuel for a fuel cell. Any use of fossil fuels releases CO<sub>2</sub> into the atmosphere. The release of CO<sub>2</sub>, which had been locked-up underground in the form of oil and natural gas, coupled with the effect of the depletion of the CO<sub>2</sub> fixing forests has caused the CO<sub>2</sub> content of the atmosphere to rise from a value of 280 parts per million by volume (ppm) at the beginning of the century to a value of 370 ppm in 2001.

Scientists believe that atmospheric CO<sub>2</sub> may be responsible for unpleasant weather effects, leading to the formulation of the 1997 Kyoto Protocol to make efforts to reduce CO<sub>2</sub> emissions. Despite this, the Federal Government is worried that implementing the Kyoto protocol may cause severe damage to the United States economy.

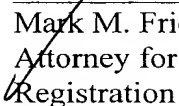
The use of the fuel composition of the above-referenced patent application encourages the use of methanol instead of natural gas. Methanol is a non-fossil energy source. Methanol can be produced *in situ* at remote locations, reducing the need for the energy and the environmental damage associated with fuel transport. The use of the fuel composition of the above-referenced patent application can make a significant contribution to the maintaining the

quality of the environment by encouraging the use of replenishable energy sources and reducing CO<sub>2</sub> emissions without damaging the American economy.

6. Certain fuel cells known in the art use methanol as fuel for a fuel cell. Due to engineering limitations, the fuel cell is charged with an aqueous solution (anolyte) containing no more than 5% methanol. When the methanol is used-up, the solution must be discarded as hazardous waste due to its methanol content. Further, fuel cells using a fuel solution with only 5% methanol are not efficient for mobile applications as a high deadweight of water must be transported along with the essential elements of the fuel cell.

The use of the electrode and the fuel cell of the above-referenced patent application allows for a significantly higher methanol content than heretofore known, allowing for the construction of significantly more compact and light weight fuel cells, appropriate for mobile applications and for vehicular power applications. Further the use of the electrode and the fuel cell of the above referenced patent application reduces the volume of hazardous waste produced, reducing the costs of waste disposal and thus encouraging the use of fuel cells.

Respectfully submitted,



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